

O'MEARA et al. - 10/630,969 - Atty. Dkt. No. 071469/0303535

REMARKS

By this Amendment, no claims have been amended, canceled, or added. Accordingly, after entry of this Amendment, claims 1-54 will remain pending. Claims 32-54 have been withdrawn from further consideration.

In the Office Action dated September 17, 2004, the Examiner rejected claims 1-31 under 35 U.S.C. § 103(a) as unpatentable over Kraft et al. (U.S. Patent No. 6,261,934) in view of Park et al. (U.S. Patent No. 6,498,097). The Applicants respectfully disagree with the Examiner's rejection and, therefore, respectfully traverse same.

In contrast to the present invention, Kraft et al. describes a dry etch process, not an oxidation process. Accordingly, Kraft et al. focuses on the removal of one or more layers from an integrated circuit structure. This is antithetical to the present invention, which concerns the creation of an oxide layer.

The Examiner cited to various passages in Kraft et al. in support of the rejection of the claims. The Applicants have reviewed, in detail, the Office Action and the references and respectfully submit that Kraft et al. provides little support in the rejection of the claims. There is nothing in Kraft et al. to suggest a method of forming a semiconductor microstructure that combines a number of features including forming an oxide layer of the substrate, the layer being formed in a self-limiting oxidation process, where the partial pressure of the oxygen-containing gas in the process chamber is less than about 50 Torr. Accordingly, the Applicants respectfully request that the Examiner withdraw the rejection under 35 U.S.C. § 103(a).

In contrast to the present invention, Kraft et al. describes a dry etch process for removing several layers from an integrated circuit structure. The steps of the etch process are illustrated in Fig. 1. As discussed at col. 4, lines 19-34, a plasma etch step 110 is first performed to etch through the metal layer. As illustrated in Fig. 1B, the metal layer is tungsten W. Next, another etching process is employed to remove the TiN layer and any remaining photoresist layer. (Kraft et al., col. 4, lines 53-56.) As discussed at the top of col. 5, the TiN conditions do include an oxygen-containing feedgas at a pressure of 1.3 T. (Kraft et al. at col. 5, lines 1-11.) The Applicants respectfully submit that, while the gas contains oxygen, the gas is being used to remove a TiN layer, not to create an oxide layer.

Other portions of the disclosure in Kraft et al. support the Applicants' argument that Kraft et al. cannot be relied upon properly to reject the claims. For example, at col. 6, lines 45-55, one example of the etch process is described. In this example, a combination of O₂

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and C_2F_6 is used to remove the TiN layer. Then, pure O_2 is used to remove the bulk photoresist layer. Finally, O_2 and C_2F_6 are employed, at room temperature, to remove the remaining TiN, with high selectivity to SiO_2 . At no point does Kraft et al. suggest the formation of an oxide layer under the conditions recited by the claims.

Further, the Applicants respectfully submit that, because Kraft et al. describes an etch process and not a process including the formation of an oxide, Kraft et al. must be said to teach away from the claims of the present invention.

Park et al. does not assist the Examiner with the rejection of the claims for several reasons, some of which are discussed herein. Park et al. describes a apparatus and method of forming a preferred orientation for a platinum (Pt) film using oxygen. There is no discussion, however, in Park et al. of creating an oxide layer. As a result, Park et al. does not correct the deficiencies noted with respect to Kraft et al. and, accordingly, cannot be combined properly with Kraft et al. to render the claims obvious, as set forth by the Examiner.

In dramatic contrast to the present invention, Park et al. describes a process for the formation of a platinum layer with a specific crystallographic orientation (*i.e.*, a (200) orientation). To reach this result, a platinum film is deposited on a substrate in an oxygen-containing atmosphere. (Park et al. at col. 6, lines 17-21.) The layer is then annealed to drive out oxygen contained therein. (Park et al. at col. 6, lines 21-23.) Orientation of the platinum crystals may be controlled by controlling the partial pressure of the oxygen component of the gas. (Park et al. at col. 6, lines 23-28.) There is nothing in Park et al., however, that would suggest a method of forming a semiconductor microstructure that combines a number of features including forming an oxide layer of the substrate, the layer being formed in a self-limiting oxidation process, where the partial pressure of the oxygen-containing gas in the process chamber is less than about 50 Torr. As a result, the Applicants respectfully request that the Examiner reconsider the rejection under 35 U.S.C. § 103(a), withdraw the rejection, and pass the claims to issuance.

In view of the foregoing, the claims are now in form for allowance, and such action is hereby solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to contact the undersigned at the telephone number listed below.

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All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully Submitted,

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